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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Samuel Neto

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EXAMINER

NGUYEN, COLETTE B

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

10/13/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/565,731	Applicant(s) NETO ET AL.	
	Examiner COLETTE NGUYEN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the application

This is the 2nd office action after RCE

Claims 4, 11 and 16 amended. Claims 1 to 18 are presented for examination

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberle et al. in view of Beier et al. (US3,506,630).

5. Regarding claim 1. Eberle teaches a support catalyst to be used in a gas phase oxidation. The catalyst is formed by using a support with a coated composition of titanium oxide (TiO_2) and Vanadium Pentoxide (V_2O_5) (Col2, ln 48-52), forming in an aqueous dispersion of an organic copolymer binder of vinyl acetate/ethylene (vinyl acetate is a vinyl $\text{C}_2\text{-C}_4$ carboxylate and ethylene is an α -olefin), having excellent adhesion of the coatings, which is particularly important for transport and charging of the catalysts into the reactor (col3, ln48-60). Eberle also discloses the binder amounts of 10-20 wt% based on the solids content of the suspension. After the catalyst is charged in the reactor, these copolymers burn out quantitatively in the stream of air within a short time. Eberle is silent on mole ratios of the components of the copolymer binder. Vinyl acetate-ethylene copolymer is a well known compound in the art for adhesion and dispersion ability for a long time due to their excellent stability toward light and aging and their mechanical properties. Beier discloses a process of polymerize of a vinyl acetate-ethylene copolymer excellent in adhesive property, used for binding and dispersing in coating application wherein the composition of vinyl acetate-ethylene comprises 20-70 mol% of vinyl acetate and 30-80 mol% of ethylene, with or without additional free radical polymerizable monomers in an aqueous dispersion. (col 2, ln 48-60, col3, ln 9-25, Claim 1). As both, Eberle and Beier disclose vinyl acetate-ethylene

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copolymer binder for adhesion, it would have been obvious to one of ordinary skill in the art at the time of the invention to have provided the vinyl acetate/ethylene copolymer binder in the catalyst composition of Eberle of 20-70 mol% (the claim is 63-70 mole%) of vinyl acetate and 30-70 mol% (the claim is 30-37 mole%) of ethylene, as taught by Beier, as compositions of vinyl acetate/ethylene copolymer used for providing an aqueous emulsion adhesive composition. It would have been obvious for one of ordinary skill in the art at the time of the invention to experiment and optimize the teaching of Beier, especially with or without the additional monomer (since they have the same K value). The addition of other monomer pertains more about the opacity of the product rather than the adhesion as the objective to use the copolymer in the case of a catalyst is to bind and to disperse the V_2O_5 to the support for better performance as a catalyst of gas phase oxidations

"The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir.1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malaqari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

6. Regarding claim 2 and 3. Eberle discloses a vinyl acetate copolymer of ethylene-vinyl acetate (Col3, ln 60).

7. Regarding claim 4. Eberle in view of Beier disclose a catalyst for gas phase oxidation of claim 1 and 2 wherein the ethylene-vinyl acetate copolymer comprises from 20-70 mol% (the claim is 63-70 mol%) of vinyl acetate and 30-70 mol% (the claim is 30-

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37 mole%) of ethylene. The claim ranges are within the disclosed range therefore anticipated

8. Regarding claims 5 and 17. Eberle teaches 5-90% by weight of TiO_2 , comparing to 60-99% by weight as claimed. Also, for V_2O_5 the percent by weight is 1-50%, comparing to 1- 40% by weight as claimed. (Col2, ln 48-58) .The parameters and compositions encompass or overlap the parameters and the compositions of the instant claims.

9. Regarding claims 6 and 14. Eberle teaches a use of promoters such as Cs compound of 0.01-1.0 wt% and P compound at 0.01-10 wt%, and up to 10% by weight of antimony (Sb_2O_3). (Col.3, line 39-47). The parameters encompass the parameters of the instant claims.

10. Regarding claims 7,8, 9. Eberle teaches a process for preparing acid anhydrides using the coated catalysts with o-xylene and naphthalene and an air stream charged to the reactor at 300C. (Col. 3,4). Furthermore, Eberle also specifies that the catalysts are formed in situ by burning out the binder. The process taught by Eberle encompasses the claimed process.

11. Regarding claim 10,11 and 12. Eberle discloses an improved catalyst to be used in the oxidation of naphthalene or a mixture of naphthalene and o-xylene. The catalyst has an inert support and a surface coating comprising : 5-90 wt% of titanium oxide (TiO_2), 1-50 wt% of Vanadium Pentoxide (V_2O_5), 0-10 wt% of transition metal oxides (Col2, ln 48-52), forming in an aqueous dispersion of an organic copolymer binder of

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vinyl acetate/ethylene (vinyl acetate is a vinyl C₂-C₄ carboxylate and ethylene is an α -olefin) (col3, ln48-60). Eberle is silent on mole ratios of the components of the copolymer binder. Vinyl acetate-ethylene copolymer is a well known compound in the art for adhesion and dispersion for a long time due to their excellent stability toward light and aging and their mechanical properties. Beier discloses a process of polymerize of a vinyl acetate-ethylene copolymer excellent in adhesive property, used for binding and dispersing in coating application wherein the composition of vinyl acetate-ethylene comprises 20-70 mol% of vinyl acetate and 30-80 mol% of ethylene, with or without additional free radical polymerizable monomers in an aqueous dispersion. (col 2, ln 48-60, Claim 1). As both, Eberle and Beier disclose vinyl acetate-ethylene copolymer binder for adhesion, it would have been obvious to one of ordinary skill in the art at the time of the invention to have provided the vinyl acetate/ethylene copolymer binder in the catalyst composition of Eberle of 20-70 mol% (the claim is 63-70 mole%) of vinyl acetate and 30-70 mol% (the claim is 30-37 mole%) of ethylene, as taught by Beier, as compositions of vinyl acetate/ethylene copolymer used for providing an aqueous emulsion adhesive composition. It would have been obvious for one of ordinary skill in the art at the time of the invention to experiment and optimize the teaching of Beier, especially with or without the additional monomer as this pertains more about the opacity of the product rather than the adhesion as the objective to use the copolymer is to bind and to disperse the V₂O₅ to the support for better performance as a catalyst of gas phase oxidations.

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"The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir.1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malaqari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

12. Regarding claim 13. Eberle teaches a fixed bed reactor with two beds packing where the support bodies of different shape and size are in layers and different concentration and compositions of the active components are to be expected. (Co14.1 line 25-30 and Col 6, line 57). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teaching of Eberle then optimize the conversion by loading more TiO_2 at the upstream of the reactor. In view that,

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Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malaqari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

14. Regarding claim 14. Eberle discloses a precatalyst according to claim 13, wherein the precatalysts comprises up to 10 wt% of antimony oxide and from 1wt% of a phosphorous compound.(Col 3, In 39-46). He does not specify the upstream nor downstream loading; however it would have been obvious for one of ordinary skill in the art at the time of the invention to experiment with the loading locations to optimize the contact for conversions. In view that,

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"The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

15. Regarding claim 15,16 and 17. Eberle disclose a gas phase oxidation catalyst wherein the support catalyst comprises a nonporous inert support body and a surface coating with transitional metal, 5-90 wt% TiO₂, 1-50 wt% V₂O₅, formed in an aqueous binder of vinyl-acetate/ethylene copolymer which is excellent in adhesion and dispersion ability. He is silent in molar ratio of the copolymer of the binder. Beier discloses a process of polymerize of a vinyl acetate-ethylene copolymer excellent in adhesive property, used for binding and dispersing in coating application wherein the composition of vinyl acetate-ethylene comprises 20-70 mol% of vinyl acetate and 30-80 mol% of ethylene, with or without additional free radical polymerizable monomers in an aqueous dispersion. (col 2, ln 48-60, Claim 1). As both, Eberle and Beier disclose vinyl acetate-ethylene copolymer binder for adhesion, it would have been obvious to one of ordinary skill in the art at the time of the invention to have provided the vinyl acetate/ethylene copolymer binder in the catalyst composition of Eberle of 20-70 mol% (the claim is 63-70 mole%) of vinyl acetate and 30-70 mol% (the claim is 30-37 mole%) of ethylene, as taught by Beier, as compositions of vinyl acetate/ethylene copolymer used for providing an aqueous emulsion adhesive composition. It would have been obvious for one of ordinary skill in the art at the time of the invention to experiment and optimize the

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teaching of Beier, especially with or without the additional monomer as this pertains more about the opacity of the product rather than the adhesion as the objective to use the copolymer is to bind and to disperse the V_2O_5 to the support for better performance as a catalyst of gas phase oxidations.

"The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir.1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malaqari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

16. Regarding claim 18. Eberle in view of Beier discloses a catalyst as claim 1 and 5. As the percent of vanadium and titanium are the same as the instant claims, it would be obvious that the catalyst would have an H_2 consumption similar to less than 5.5 mole/mol of vanadium, as it would be an inherent or obvious property resulting from the catalyst composition made by the process as set forth by Eberle in view of Beier. See MPEP 2112.

Response to Arguments

Applicant's arguments filed on 07/31/09 have been fully considered but they are not persuasive.

The instant claim is a gas -phase oxidation catalyst with 1 to 40% by wt of vanadium oxide (V_2O_5) with titanium oxide (TiO_2) from 60 to 99% by wt. The catalyst is made by

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contacting a support with an aqueous organic binder solution of vinyl-acetate at 63 to 70 mole% and ethylene at 30-37 mole% copolymer.

The catalyst composition and its method of making are clearly disclosed by Eberle et al. in US5,792,719 wherein the vanadium oxide is from 1 to 50% by wt and titanium oxide is from 5-90% by wt. The catalyst is made by contacting a support with an aqueous organic binder of vinyl-acetate/ethylene at 10-20% by weight (the applicant's specification shows also a 10% by weight on page 10). He does not specify the mole percent of olefin and the mole percent of vinyl acetate. However, the use of ethylene and vinyl acetate binder which is well known in the art as coating and adhesive is specified by Beier (US3,506,630) as 30 to 80 mole % of α -olefin and 20 to 70 mole % of vinyl acetate. Beier goes on by disclosing that "due to their excellent stability toward light and aging and their mechanical properties which may be varied by means of variation of the ethylene content and the molecular weight such co-polymerization are used with increasing frequency in the industrial field". And on col 2 line 57, Beier teaches an aqueous dispersion, same as Eberle suggests. As both Eberle and Beier teach organic binder of vinyl acetate/ethylene, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings and experiment with different mixture ratio to optimize the binder and come up with the mole percent of olefin and vinyl acetate as disclosed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/
Examiner, Art Unit 1793

October 9, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793